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Conversations with an Eminent Labour Economist: Edward Lazear

Professor Edward Lazear (EL) is the Morris Arnold and Nona Jean Cox Senior Fellow at the Hoover Institution at Stanford University and the Jack Steele Parker Professor of Human Resources, Management and Economics at Stanford Graduate School of Business.
This interview, with ***Anne Daly (AD)*** of the Centre for Labour Market Research, University of Canberra and ***Boyd Hunter (BH)*** from Centre for Aboriginal Economic Policy Research at the ANU, took place at the inaugural Asian and Australasian Society of Labour Economics (AASLE) meeting in Canberra, December 2017.

AD/BH: *What do you see as the big advantage of using economics ideas and presenting them in a slightly different form for non-economists as you did in personnel economics.*

EL: That's a good question and in some ways an easy one. What economists are very good at doing is stating things in a rigorous and parsimonious way. I'll give you an example. I have a buddy, Charles O'Reilly (Stanford), who is a very distinguished industrial psychologist who works in organisational behaviour; and he is always amazed at how economists can strip away the extraneous to get to a quick and clean answer. Now, of course, he's sometimes critical of the fact that we don't see all the nuances and all the difficulties, but it's clear that he is impressed with the power of the economic analysis and I think that's the same thing that I would say about personnel economics - a field that is especially fuzzy. Basically, the questions in personnel economics are completely traditional. They're the kinds of things that human resources people have been thinking about forever. How do you motivate workers? How do you train workers? How do you retain workers? How do you hire workers? I mean, these are just standard things. But the human resources people would think of them in a very loose way because they didn't have a rigorous disciplinary framework. I think economics forces you to think about things in a stripped down way that allows you to get to a clean answer. That's the big advantage.

AD/BH: *There has been a lot of discussion here in Australia, as in countries all around the world, about the relative pay of CEOs. How significant do you think tournament theory is as an explanation of the rising relative pay?*

EL: Funny you should ask. I was in Sweden two weeks ago speaking to the 20 to 25 leading Swedish CEOs in something called the 'remuneration academy'. They also wanted me to use tournament theory to talk about two questions. The first question is how one can rationalise CEO pay? The second question is more specifically about explaining the rise in CEO pay relative to other remuneration. Can we think about CEO pay in a coherent way using tournament theory? There's an enormous literature now, empirical literature as well as theory (but mostly empirical), that documents how tournament theory works to predict what's actually going on in firms and it works very well. When I say it works very well, it works very well to explain, one, what firms do, and two, how when firms pay attention to this and implement it appropriately what you end up seeing is those firms perform better.

I'll give you an example. Sweden is a very egalitarian society and there's always pressure to monitor the compensation of the CEO and make sure it doesn't get out of line. If anything, the danger that you have to worry about is that no one is ever going to tell you that your CEO is underpaid. Plenty of people will tell you that your CEO is overpaid. And the question is if you compress the pay too much what are some of the consequences of that for the organisation? So, I went through a variety of papers, and a lot of them are in the finance literature because the finance guys are interested in studying compensation and how that motivates people. It's quite compelling. Now, the second question that you asked is a little bit different. What we have seen over time is that CEO pay has gone up and gone up relative to median worker in the firm. The question is why? And, of course, there's sort of the sinister view of that, which is that CEOs are capturing the boards and getting the boards to increase their compensation. There is some evidence for that, but I guess the obvious response is 'what's new'? CEOs were always trying to feather their own nests. I never was surprised by that, but the question is why now or why are they more able to do it now than they were in the past? There's a serious analytic literature associated with [the question]: are there ways to explain the differential? And there are basically two angles on this. One is firm size and the other is risk. The firm size one is best probably captured by work by Xavier Gabaix at Harvard and some of his co-authors. And what they've done is to look at how the change in the distribution of firm size would predict what you would expect for CEOs. So, for example, one of my dearest colleagues and teachers, Sherwin Rosen, who unfortunately passed away quite a few years ago now, had a nice paper on the relationship between size of the firm and CEO compensation (not one of his best - known papers). He found that the elasticity was 0.3 and it was not just true in the United States but it was true in every country that he looked at (Rosen 1992). I don't know why that's true but assume that- take that as a given - there seems to be a relationship between the size of the assets and CEO pay What Gabaix and Landier (2008) do is they essentially say, okay, well, if you look at the firm size distribution and look how that's changed over time that will imply that you're going to get increasing CEO pay and they argue that you can account for all of it by the change in the distribution of firm size. Whether they're right or not is unclear, but it certainly is a rigorous and analytic answer.

AD/BH: *Can we ask a question about the 'idea of job as a concept' and rent sharing both discussed by David Card at the 2017 AASLE Conference?*

EL: He was talking about monopsony. Monopsony sounds sinister, but I think of it as a more benign phenomenon. Economists sometimes think of monopsony as a bad thing. It's a distortion. I don't think of it that way, and again it's interesting because this came up in the interview that I did in Sweden with one of the largest CEOs and owners of Halverson, which is a huge Swedish conglomerate. They own 'everything' basically. He said someone asked him, why don't you pay your CEO less? You could get away with paying your CEO less. He didn't quite respond the way I would or David would have: but what he said was: look, 'I could pay him less, but then maybe he leaves or something and why do I want to take that chance'. I think we all have been in situations where you're negotiating with a boss over your pay and I'll tell you a personal story. I remember a few years back. I was at Stanford still and University of Chicago was trying to recruit me, trying to get me to move back to Chicago. So the president of the university had me in and the provost had me in and the dean had me in and they're all trying to, make me feel good and warm and cosy and cuddly and everything about Stanford. And I remember the dean saying to me, well, we can look at your salary and see if we can do something. And I said, which is probably pretty unusual, 'don't worry about it. I make enough. You don't need to mess with my salary. I'll decide.' And the reason that I said that is essentially what I think is going on in these rent sharing aspects. That is, that it's best to leave something on the table for each side. So, you don't want to squeeze the worker down to the worker's reservation wage, to the minimum amount that the worker will take. Nor do you want to push the firm up to the point where they're basically indifferent between whether you stay or go. You want both sides to essentially be happy. And if you think about that it's a bilateral monopoly kind of bargain. And what you would say is you want to kind of split the surplus and make sure that both sides are happy because if you do that then the long run situation is better. Now, the implication of that, again, going back to what David was saying is – the way I put it –it's a more benign way of putting it because what I'm essentially saying is there are positive effects on productivity for both the organisation and the worker. There are also positives effect on happiness and utility for the worker. It's not like one side is exploiting the other which is what you think about when you think of monopoly or monopsony. In this case what you're thinking about is sharing the rents in a way that makes each side better off and increases the value of the firm.

AD/BH: *But what of the situation of bilateral monopoly where the worker and the firm had market power?*

EL: Well, David Card called it mark-up but the idiosyncrasy comes in the worker – essentially a worker preference effect. So he [David Card] talked about this BLP, (Barry, Levinsohn and Pakes 2004) kind of approach where everybody is idiosyncratic. The firm is idiosyncratic. The worker is idiosyncratic. If everything is idiosyncratic you have a match. You're going to have some surplus.

AD/BH: *So it's a bilateral monopoly?*

EL: It is implicitly a bilateral monopoly. But again, the question is how do you deal with that? And I think the implication of that is that a bilateral monopoly matters a lot for high level workers. It doesn't matter at all for janitors. Therefore, if you look at the janitors at Google, my guess is they don't make a heck of a lot more than the janitors at any other firm in the Bay area.

AD/BH: *It is not only because of outsourcing it's because of the elasticity of their labour supply.*

EL: Yeah, that's essentially it.

AD/BH: *It's easy enough to replace them.*

EL: Yeah. Nothing idiosyncratic. There's nothing specific. But the story that I'm telling, the way I'm telling it, the bilateral monopoly story, is essentially saying as you get to the high levels of the firm you've got a bigger and bigger surplus. For example, having Zuckerberg at Facebook is a really good match. They've been together for a very long time. He invented the place. He knows a lot more about it and he is much more valuable to Facebook than he is to another firm. Similarly, Facebook is much more valuable to him than another firm (in terms of working there). There's sort of bilateral value on both sides. Therefore, when Facebook was going public, if the board or the shareholders were to say 'hey, we should be squeezing Zuckerberg', that is probably not such a great idea. I think of it in a more benign way because when you say, 'leave something on the table for both sides', you make both sides happy It doesn't sound like a bad thing, it sounds like a good thing. Whereas when you say monopoly or monopsony, it sounds like a bad thing.

AD/BH: *And what of your paper on the 'job as a concept' (Lazear 1990)?*

EL: Well, of all the papers I have written, I feel like I failed most on that paper because it should have been an important paper. I wrote that paper for a conference volume, at Harvard. I had an internal firm - based dataset and I looked at whether the job title mattered in terms of predicting wages (i.e., how much of the variance in wages within the firm do you explain by job title). If you think about basic microeconomic theory, there is no such thing as a job. In fact, in human capital theory it's quite the opposite in that what you do is you take this stock of human capital that a person has, multiply that times the rental price and that's the wage. And it doesn't matter where they're slotted. There's no such thing as slots. There's no such thing as jobs. So, what I did was I walked through a number of different ways that we could think about jobs. One was like in a tournament model. It's essentially a wage level, it's just promotion to a different wage level. Another is a job is a set of tasks, for example. Another is a job is a set of characteristics, non-monetary, non-pecuniary characteristics. And I just thought about different definitions of the job. And then I said, alright, let's see as an empirical matter how important jobs

are and, of course, a job explains a whole lot and if you make it very, very detailed the job explains everything because it's essentially a name for a wage. So, if you thought about government workers their job essentially is their wage and so you could get an R square that would be close to 1 if you were thinking like our government.

AD/BH: *Well, as David Card talked about at this conference with an R square of 0.95. So you might not have been taken notice of at the time, but it's a slow burn idea.*

EL: I say it was a failure on my part because I published it in this goofy place. It was obscure. But it was discovered by one of my students, Mike Gibbs and others (Baker, Gibbs and Holmstrom 1994a, 1994b). Essentially, they are the same paper using another firm-based dataset (with a twist). Their paper became a very famous and has been well studied. So I always felt like I kind of lost out on that one. It was sort of my idea but I've gotten enough credit in my life. It's okay.

AD/BH: *Are you a fan of behavioural economics? What do you think is the main contribution of behavioural economics to economics?*

EL: Well, I must say I'm not a fan. In fact, I would say my two most important mentors and role models were Gary Becker and Sherwin Rosen who could be classified as pioneers in behavioural economics. I think of Gary as probably the greatest social scientist of the 20th century. And I think Gary is the quintessential behavioural economist. And the reason I say this is that he thought about behaviour, weird, interesting, novel behaviours, from the time he started his thesis – discrimination, fertility, women's labour supply, family economics. Every possible weird behavioural kind of thing you could think of, but he did it in a hardnosed analytic rigorous way and he won. There is no one who has had more impact on economics than Gary. That's why I say he's the greatest social scientist. Not necessarily the greatest economist. I mean you have guys like Keynes and Milton Friedman and so forth. But in terms of just general social science he changed the field more than anybody else. And his way of thinking about behaviour to me is the right way of thinking about it because what he did was he thought hard. He used very simple models and he pushed them in the most creative substantive way to get results that just no one could ever get and he was right. And he was ridiculed. absolutely ridiculed, when he came out with these ideas. I mean think about calling a child a consumer durable. Who would do that? Even economists found that offensive. But what he did is when you call a child a consumer durable the natural thing you think about is, well, if it's a good it has a price. What's the price? And that led him to think about, well, the main price of a child is a time price. And then he starts thinking, well, what's the time price? It's the mother's wage rate. Well, if it's the mother's wage rate what's the most important implication of that? The implication of that is if you want to lower fertility rates in a country, you educate girls. This is probably the most profound implication that virtually every government and NGO agency that deals with fertility and population has incorporated. They don't even realise it comes from Gary's work. That's the kind of stuff you do when you think hard about stuff. That's the kind of behavioural economics I like.

AD/BH: *Yes. I understand your point - but I've heard it said that what we currently describe as behavioural economics is really nothing that a good used car salesman didn't know already. Do you think that that's unfair?*

EL: I think it's unfair. I would say that my favourite behavioural economist is George Akerlof. I think George is great. I love him. I love him personally and I love him in terms of his work and I will tell you why. George is a real economist. He's a little more out there than Gary was, but not really - it's just a different style. What George does is he writes down economic models. And what I mean by economic models is that they have maximising behaviour and an equilibrium. That's what economists do and do well. That's why colleagues in my university admire economists so much because we know how to formulate a question and we know how to answer it. And so what George does very well is he takes what we might think of as an unusual preference or an unusual kind of behaviour, he builds it into his model and he writes it down formally. He says, what's the equilibrium? Therefore, George thinks about things in a formal hardnosed way. He's not a nose tweaker. He's not a guy who's going out there trying to say, 'well, I can't figure out what's going on, so it must be behavioural.' I don't even know what that means, but you hear that so often. Well, maybe there's something behavioural. What do you mean by behavioural? It means you don't know what's going on so you're not going to think hard about it. You're just going to make up a story. Well, that's not science. That's not scholarship. George never does that. What George does is he thinks hard about it, he writes it down, he works it out, and he comes to a conclusion. It may be wrong but it's a refutable hypothesis that's science.

AD/BH: *What do you think are the key issues now for labour economics?*

EL: Well, I would say two things. They're the same as they've always been. What people care about is job security and earning a decent standard of living. That's at the centre of labour economics and is what we always care about. The question, of course, is how do you guarantee those two? I would say that what we tend to do is we sometimes focus too much on the trees and ignore the forest. Let me give you an example. We talk a lot about inequality and it comes up all the time as it should. It's a very important issue. What's happened to inequality over time? Inequality has gone down not up. Way down. Why has inequality gone down? Because two of the poorest countries in the world are enormous, they're a third of the world's population and they've had huge growth and as a result of that the inequality in both of those countries, India and China, has gone way up – China particularly – but the average level has gone way up which means that you've taken, close to a billion people and raised them from one meal a day into the middle class – that is an enormous change. And the reason I say that that's the forest and not the trees is you have to ask what caused that? What brought that about? It wasn't that we figured out a way to tax the rich. It wasn't that we figured out a way to get the CEOs to take less money. It's that essentially what we did in China and in India was we went through reforms that let the market work and that had a huge effect on growth. I mean there's no doubt about it. Deng Xiaoping, to my mind, is the most important figure of the 20th Century.

Why? Because he took an enormous country and he said, 'we're not going to say that being rich is bad anymore' and completely reformed the whole economic system. Obviously, it's still communist and they still may have problems. There's a lot of social problems. But that to me is a key thing. Alright, now, why do I raise the example of China? Vietnam, by the way, is doing the same thing right now. India, of course, has done that as well. Why do I raise it? Well, because what I worry about is 'why are we so concerned about how much do the rich guys make'? I will give you an example. I was on a panel with Joe Stiglitz, a good friend. We have different political views, but we certainly get along. We were talking about inequality and I said, 'Joe, my guess is you're richer than I am, but that's not a major social problem'. I'm rich enough. The major social problem is not how wealthy the wealthy are, even though you may not like that. You may be jealous of them, but that's a relatively minor issue. What we really care about is worrying about the lowest 20 per cent of the distribution and what do you do to raise those individuals up? And that maps both into wages and into job security. It may be a cliché but it's always about human capital. There's just no other solution to this. In the long run you've got to raise the human capital of these individuals.

China figured out a way to do that through schooling and so forth and then letting these people use their human capital in the most effective way. We're struggling with that right now in the US. I know Australia has done a pretty good job over the past decade or two, but it's not been true in the US. It's not been true in Europe. It is not just a problem at the tails of distribution. It's true throughout the distribution. So, if you look at the wages of a high school graduate, who is essentially the median person in the US, relative to the college graduate, you will see is that they do a lot worse than the person with vocational training. In turn the wage of those with vocational training in the US is roughly equivalent to the high school graduate in Germany measured relative to their college graduates. Why is that? Well, because Germans with vocational qualifications actually have some skills and as a result they're productive. In some sense it's a reflection of American optimism, so it's arguably a good thing. We always think everybody can make it and we don't want to write someone off as they do in Germany at age 12. You don't want to do that. But the point is that what ends up happening in our high schools is if you end up not being on the college track in your junior year, it's clear, you're just not going to get into a college. What do schools do? They've give you a watered down academic curriculum. Instead of giving you calculus or trigonometry, they're giving you some lower level maths that you're not going to use when you leave school. I think that's a problem in our system that we have to think hard about. Community colleges have done a little bit, but it's not been very successful. As a country we are struggling with that.

AD/BH: *What do you think about the balance of what gets taught in an economics degree: the balance between theory, history and technique.*

EL: Well, I'm in a very theoretical group. Ironically, and somewhat surprisingly the business school at Stanford is kind of mostly highbrow theory people. I'm not a high brow theorist obviously, but I would say that there's a danger of doing too much of that. However, I would say the danger now is more in the other direction. Rather than

too much theory, there is too much rushing to the data. It's very easy to find a dataset, create an instrument, find some natural experiment or do a field experiment or do a lab experiment and grind out some results. People do not think hard enough about what the truth is and no one really cares very much about what the data means. It reminds me of the old expression in the United States, 'it's dance with who brung you'. I don't know if you guys use that turn or phrase.

The basic idea, and the reason I use that expression, is we've got some terrific skills, we've got some terrific techniques and that's what differentiates us from other social sciences. I think we shouldn't just become demographers or statisticians or just go out data grubbers, we really should use what we have to shed light on these issues. I think that's always been my kind of trademark. I've learned it from others. I think Sherwin was good at that. Gary was good at that. There are plenty of others at University of Chicago and other places that are good at it. But I think it serves you well and I'm concerned that we're moving a little bit away from that. George Akerlof feels the same way. He told me it is hard to get ideas published now in the major journals. There's sort of a formula. They want structural industrial organisation or they want an instrument or some cute thing. Even if you've got a new idea that may actually be profound, it can be hard to publish. If George is saying that, then it is an issue for anybody.

AD/BH: *What would you be saying to someone who was thinking about doing a PhD in economics? Would you be encouraging them? Or would you be telling them to go and get a job?*

EL: No, I think getting a PhD in economics is one of the high callings of mankind.

AD/BH: *You said that with a straight face.*

EL: I'm serious. I love economics. I think it's one of the most powerful sciences that we have ever come up with. I was chairman of the Council of Economic Advisors so I was the president's Chief Economic advisor. Does he have a Chief Sociological advisor? Does he have a Chief Psychological advisor? You know, he really doesn't even have a Chief Political advisor except to the extent that his Chief Political advisor is someone who is telling him how to get votes. In government and public policy the only social science is economics. It really is. And there's a reason for that. That's not just all of us are good at scheming and capturing government officials. There's a reason they actually listen to us and it's because we actually have something substantive to say.

AD/BH: *The reason we're laughing is we deal with some anthropologists who are suspicious of economists and some claims made by economists.*

EL: Yeah, and many sociologists have a similar distrust of economists as well.

AD/BH: *One of the things in Australia which is a bit peculiar for some reasons, is that economics has got a bit of a bad name, the number of students doing economics degrees has been declining and people have been moving across into broader business degrees. Is that sort of trend happening in the US?*

EL: It is. I would say it takes a slightly different form in different places. Certainly at places like Stanford -and I don't mean to be snooty - but we have plenty of applicants. What you do see at Stanford is a fabulous undergraduate population, but few of those individuals go into academia. Instead they go to law school. They go to medical school. They go to business school. They go to the professions. And I think it is because they can just make so much money. The truth is academics at the top universities are pretty darn well paid. I'm certainly not complaining about my salary. I've lived a good life and have enough to leave to my daughter who is a public school teacher and I think that's just fine. I'm kind of happy to be working and being able to do what I think is very valuable for society but unfortunately society doesn't necessarily pay adequately for it. But the point is if you're looking at becoming a lawyer, becoming a CEO at a big firm or going to a start-up, or even working at a place like McKenzie, there is a lot of competition for the best students. I'm sure it's true in Australia as well.

AD/BH: *Yes. But something else has happened — there is an idea that undergraduate economics is too hard. So, students veer away from economics before they even begin it.*

EL: I haven't sensed that in the US. Well I shouldn't say 'in the US' because my experience is limited to two universities both of which are great universities. The undergraduates at University of Chicago and Stanford are superb. They're just brilliant kids. So, you're not going to see it there. I couldn't really speak to it elsewhere.

AD/BH: *What is the best way for economists to engage with policy makers in constructive debates.*

EL: Again, this is a question I've actually thought about. I was on a panel on exactly this topic about six months ago and, basically, I said if 'you want to influence policy the best way to do it is to get lucky and become the Chief Economic advisor to the President of the United States or to the Prime Minister of Australia'. It's very difficult for outsiders, even people like me who were very well connected, to influence policy. I still have the opportunity once in a while. I was in Washington a few weeks ago talking to congress and talking to the White House and so forth but it's rare. Again, I'm just using my personal experience because I don't know about Australia. But what we did when I was in the White House, every morning we called a senior staff meeting which was the president's chief people. So the national security advisor would be there and we'd have the press secretary and we'd have the legislative affairs person and then you'd have the economics guys. And we would all talk about our various portfolios and brief the other members of the cabinet and senior staff on exactly what was going on. The press secretary every day, at least in our administration, would summarise for us

the most important op-eds in the top newspapers. If you can't get into the government (or actually work in the government), the best thing to do is write. I don't know the Australian journalism scene, but if I were doing this in the US I would put my stuff in the Wall Street Journal. They always read the op-eds in the Wall Street Journal. Especially, article written by someone that they know personally. Even if you're just a distinguished academic/business [person]/CEO, they will take that seriously and those articles are discussed in those meetings. So, if you can't be there the best thing to do is to write stuff for the popular press, but make it a serious article not just an opinion piece. Give them numbers. Give them facts. And they will take it seriously.

AD/BH: *A concern recently is this idea about the death of expertise. You know, the idea that everyone's opinion is as good as anyone else's so why bother consulting an expert when you can look it up on Wikipedia? Do you think that's affected the ability of economists to have worthwhile input into policy debates?*

EL: Not at all. I don't know if you have been following this but we're in the process doing tax reform right now in the US. It's always a political process. I led a team to Washington with other senior people: Jim Poterba, who is the head in the NBER and a very distinguished public finance/tax economist; and Michael Boskin who is also a distinguished tax economist and also had a position in the Bush (senior) administration. It was bipartisan and included some younger people. The team talked to the White House over one afternoon and then the next day we started at 7am in the morning and we were going until 9pm at night. It was just totally exhausting. When we were talking to Senators and the House of Representatives (both sides), they were just dying to hear from us. Absolutely dying to hear from us. And they kept asking us lots of questions, technical questions, serious questions. A meeting was supposed to last an hour, but an hour and a half goes by and we are still there. We say we got to get to the next meeting. These guys were thirsty for expertise because we weren't just giving them loose talk.

Our responses focused on the most efficient way to do tax reform. For example, at one point we argued: 'don't do this tax cut, but use the 179 provision to increase benefits for small business because they're the ones that do the most investment'. What they really wanted was our data. They wanted facts that they could then use both to persuade, but also to structure policy. I just don't believe that they're not interested. And these are politicians. who have to run for office every two years. So if they're interested in policy and data, I just don't think that indifference to expertise is a serious concern. At least not in my experience.

AD/BH: *That's optimistic and encouraging.*

Turning to the global economy, how do you think that we in Australia and Asia and Oceania can fit in to the global economy as economists?

EL: Well, I guess I would turn that around. The question is, will the US and Europe still be able to fit in, in a decade or two from now? I think we have to worry that these aging societies do not suffer from a sort of sclerosis by becoming too old, too fat and

content. You guys are dynamic and young. I love Australia. I got to tell you, I love it because it reminds me of where I grew up, which was California in the '50s and '60s. A little bit rough. A little bit crazy. A little wild, fun loving and relaxed (even loose). A very entrepreneurial and dynamic place. Over time the US population has tripled and it's a very different place now than it was when I was growing up, so I think you guys are in the prime of your lives.

AD/BH: *You set up the Society of Labour Economics in the US. In setting up the Australasian and Asian Society of Labour Economics, we face more challenges in the sense there is a very different cultural context across the whole of the Asia Pacific. How can we organise the Society to ensure that it engages with both Asian and non-Asian perspectives?*

EL: Yeah, I thought about this in the context of something that I guess David Card mentioned at this conference in terms of founding societies. I was thinking, I think, why do you guys need a society? I think – well, if I'm in China or I'm in Japan or something why don't I just come to a society of labour economists that's already a well-formed society with lots of great papers, where lots of people come every year? What people are trying to do when they go to these conferences is not just learn about 'hot ideas'. They are actually trying to expose their ideas. And, so, the reason that you guys need this society is not because you need me, David Card, Steve Machin, Thomas Lemieux or people like us coming over. What you need is to give the young people in Asia and Australia an opportunity to present their work and to publicise what they're doing. To me, that is the role of your particular association. The integration is natural because first of all you are close to Asia, but also because you're English-speaking. Australia and New Zealand would be the natural places to do that because no one is going to learn Chinese in Europe and the United States. Maybe eventually but it's just too hard in the short-term. So, in the meantime they have to learn English.

AD/BH: Thanks, Edward, it was great talking to you.

EL: It was a pleasure.

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Temporary-Permanent Wage Gap: Does Type of Work and Location in Distribution Matter?

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Abstract

Recent years have seen a push for greater labour market flexibility and an accompanying upsurge of interest in temporary employment and the negative outcomes often associated with such employment arrangements. This study focusses on the pay outcome with respect to the temporary workforce in New Zealand. This country is a useful case study for such analysis, because of the low levels of employment protection legislation afforded to temporary workers relative to the rest of the OECD. We utilise decomposition analysis to assess the size and significance of unexplained wage gaps for both the aggregate group of temporary workers and the subgroups of fixed-term, casual, temporary agency and seasonal workers. Our findings signal that the majority of the temporary-permanent wage differences can be explained by observable characteristics, with no wage gap evident for fixed-term workers. We also find varying effects across the wage distribution. Quantile analysis points to a widening wage gap (particularly for casual and temporary agency workers) towards the upper end of the wage distribution, with a growing proportion of the gap that is unexplained.

Keywords: temporary work, compensating wage differential, quantile regression
JEL: J7, J8, J31

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1 Introduction

The incidence of temporary employment has risen in many developed countries in the last three decades (Eurofound, 2015). Policy makers view encouragement of a range of temporary contracts as one of the potential routes towards greater labour market flexibility; with policy discussion on this front often heightened at times of high unemployment. However, there is also a plethora of empirical research citing numerous negative impacts or associated outcomes for individuals in temporary work. For instance, Booth *et al.* (2002) and Kahn (2007) show that pay and job satisfaction are lower in temporary jobs. Adverse effects on occupational health and safety have also been identified (see Quinlan, 2003; and Francois and Lievin, 2000). Additionally, there is greater risk associated with temporary work due to poorer job security. Compensating wage theory could therefore be used to argue that temporary workers should earn a wage premium relative to comparable permanent workers, as compensation for the additional inherent risks. There is however no consistent empirical evidence of this being a feature of labour markets, with much past evidence pointing to temporary workers earning substantially less relative to permanent employees (Brown and Sessions, 2005).

A variety of reasons have been advanced to account for the rising numbers of temporary workers (see for example De Cuyper *et al.*, 2008). These reasons include free choice whereby workers choose temporary work because of the inherent and potentially preferable characteristics (Morris and Vekker, 2001, reported that one in four temporary workers wanted temporary work, as they needed flexibility, shorter hours, or needed to accommodate childcare arrangements or other family reasons); whereas others end up in temporary employment because of a lack of suitable permanent employment opportunities; and many workers enter temporary employment hoping that it will eventually turn into a permanent contract. Burgess (1997) attributes rising levels of non-standard employment (where standard employment equates to full-time ongoing wage employment) to three drivers. First, structural shifts in the economy in terms of composition of industries and occupational categories. Second, demographic forces via a significant increase in female labour force participation, requiring a strong motivation for new working arrangements that are compatible with family responsibility (Hall *et al.*, 1998). Third, cyclical reasons – particularly at times of high unemployment, when policy makers push for reduced labour market protection and rigidity. Times of recession can undermine the bargaining power of workers, resulting in a pool of unemployed and underemployed individuals, who are willing to accept employment under less favourable conditions, and in non-standard forms.

From a labour demand perspective, it is not only responsiveness of employers to business cycles that has come to the forefront, but also the need to respond to growing globalisation, and more volatile international market conditions – often forcing employers to be more flexible as they aim to remain competitive in the global economy (Brewster *et al.*, 1997). As a consequence, employment protection legislation (EPL) permitting, employers have sought to respond to these pressures by introducing new technologies and reducing their reliance on full-time labour in favour of non-standard forms of labour that can be implemented on a just-in-time basis.

There has clearly been a concerted effort to loosen the rigidities that surround EPL across Europe, and much of the recent debate amongst researchers reflects the need to assess whether this has led to the development of a strata of workers locked into precarious or temporary employment. Standing (2011, p.31), for instance, argues that 'The pursuit of flexible labour relations has been the major direct cause of the growth of the global precariat'. Standing also contends that the drive for flexibility is ongoing, with the push for more flexibility increasing at times of an economic downturn, resulting in an erosion of all forms of job security.[2] Given these sentiments, New Zealand (NZ) presents as a very useful case study to assess the potential outcomes associated with low levels of EPL. OECD indicators on EPL are based on a scale from 0 (least restrictions) to 6 (most restrictions). The OECD average for regulation on temporary employment is 2.07 (based on the most recent data – from 2013) and NZ's value on this scale is just 0.92, with only three countries having fewer restrictions, in terms of employment protection for individual dismissals for temporary contracts.[3] Additionally, a World Bank (2004) report which benchmarks business regulations across more than a hundred countries, ranked NZ 10th in terms of labour market flexibility and 5th in the OECD.

The majority of the deregulation in NZ's labour market occurred prior to 2000. However, there are a few recent examples available of legislation aimed at increasing flexibility. For instance, the 90-day trial period was introduced in April 2011, which meant that an employer can dismiss a new employee within 90 calendar days, 'without the employee being able to take a personal grievance for reasons of unjustified dismissal' (Department of Labour, 2015).[4] Another recent example involves political intervention by the central government in the Hobbit Film dispute, via the introduction of the Employment Relations (Film Production Work) Amendment Bill (see Walker and Tipples, 2011) in 2010. This bill was widely viewed as a deal required during negotiations between Warner Bros and the NZ government, to keep production of The Hobbit film in NZ. It essentially made film production workers independent contractors by default, rather than employees.

Given the very low levels of EPL in this country, if in general greater labour market flexibility is associated with greater levels of discrimination against the temporary workforce, we would expect that this would be more evident in the NZ case, relative to its OECD counterparts. On the other hand, given poor levels of protection are also experienced by permanent workers in NZ – this may result in an opposing effect and thus reduce the temporary-permanent wage gap. This study therefore seeks to empirically investigate the existence and extent of unexplained wage differences between temporary and permanent workers in NZ. While we acknowledge the numerous other potential negative outcomes associated with temporary work, such as poorer health status, lack of access to tenure related benefits and job insecurity,

2 Standing (2011) identifies seven forms of job insecurity – labour market, employment, job, work, skill, income, and representation security.

3 See OECD (2015a). There are also similarly low levels of employment protection for permanent workers against both individual and collective forms of dismissal.

4 See http://www.dol.govt.nz/workplace/knowledgebase/item/1517. This trial period is voluntary and must be agreed to by both employer and employee when setting up the employment agreement.

this study is focussed only on the wage gap prevalent between an average permanent employee and a temporary worker.

Based on our research objective at hand, we make use of pooled cross-sectional data from two waves of the Survey of Working Life (SoWL). This data provides information on not only the aggregate group of temporary workers, but the subgroups that lie beneath this – fixed-term, casual, seasonal and temporary agency workers. Analysis of these disaggregate groups is essential as past research is explicit in its view that temporary employees cannot be treated as a homogenous group (see Silla *et al.*, 2005).

We use the Blinder-Oaxaca technique to gain an understanding of the underlying reasons behind the wage gap. This method is fairly commonplace when assessing compensating wage differentials (although mostly employed when comparing private and public sector pay rates, rather than permanent and temporary workers e.g. Lucifora and Meurs (2006)). To our knowledge, it has not been used to empirically assess the existence of a pay gap for both the aggregate group of temporary workers (compared to permanent employees) as well as for disaggregate groups such as fixed-term contractors, casual, seasonal, and temporary agency workers (all relative to their permanent counterparts).

After producing average effects using the decomposition method for each of the groups outlined above, we investigate whether these hold constant across the wage distribution, with the help of quantile regressions. This provides evidence of the dynamics of the raw gap across the distribution, as well as the proportion of the gap that can be explained by observable characteristics.

The remainder of this paper is set out as follows: Section 2 summarises the relevant theoretical and empirical literature on a temporary-permanent wage gap; Section 3 provides details of the data employed and a descriptive portrait of temporary versus permanent workers in NZ; while Section 4 presents the empirical analysis and results. Conclusions follow.

2 Literature review

2.1 Theoretically

As indicated in the introduction, one theoretical argument for the existence of a wage difference between temporary and permanent workers is that of compensating wage differentials. The contention being that a competitive labour market will reward poor job security, and the other risks associated with a temporary job. However, one could also argue (with the aid of human capital theory) that the firm has to invest in greater levels of firm-specific training for temporary workers, and the wage gap is a result of this additional cost.

Labour segmentation (or Dual Labour Market) theory has also been called upon to explain wage gaps between temporary and permanent workers. Reich *et al.* (1973) was one of the early studies to define this concept and segregate the market into primary and secondary segments. Primary jobs are characterised with mostly permanent workers, who are well paid, with stable work environments, and the existence of job ladders. Whereas the secondary market is characterised by poorer

working conditions and includes temporary workers who experience higher turnover, fewer job ladders, and insecure work environments.

Another theory advanced to explain the temporary–permanent wage gap is the efficiency wage argument. Guell (2003) claims that contract renewal of a temporary contract could be used as a carrot to incentivise greater productivity from workers. Of course this signal only works if credible and firms follow through with non-renewal of poor performing temporary workers. Additionally, this method cannot be used long-term if EPL does not support repeated renewal of fixed-term contracts. For instance, in NZ, the Employment Relations Act (2000) limits the use of fixed-term contracts to instances where there are genuine reasons - like seasonal work, project work, or where the employee is filling in for a permanent employee on leave. Repeatedly 'rolling over' of a fixed-term employment agreement may well lead to the employee being deemed to be a permanent employee (Ministry of Business, Innovation and Employment, 2012).

It also seems key from the extant literature that employer costs are the motivation behind many of the reasons put forth for not only wage differentials between temporary and permanent workers, but also behind the growth of the temporary workforce. For instance, if firing costs are high, fixed-term contracts may be employed as a screening device to help employers find appropriate employees. High firing costs also means that it is more efficient for a firm to have a pool of both temporary and permanent workers (even if they are relatively homogenous and can be treated as perfect substitutes), because the former can be treated as a buffer stock towards dealing with fluctuations in demand.

Also of relevance to this study are the theories that have been advanced to motivate why the temporary–permanent wage gap would vary across the wage distribution. Comi and Grasseni (2012) use labour segmentation theory to explain why we might find a wider wage gap at the bottom of the wage distribution. Due to the dual nature of the labour market more temporary workers are found at the lower end of the wage distribution, and therefore there is greater potential for a wage disadvantage at this end. The same authors also use the insider/outsider argument and claim that when temporary jobs are used as a default buffer stock of workers, this implicitly results in greater protection and bargaining power for the insiders.

2.2 Empirically

The majority of previous empirical studies have focused on mean wage differentials (see OECD (2004) and Bentolila *et al.* (1994)). Analysing explicitly the size and source of the wage gap can be found in just a handful of articles. For instance, Jimeno and Toharia (1993) compare fixed-term workers with their permanent counterparts in Spain and find the former earn approximately 9–11 per cent less than the latter group. In a German study also focussed on the wage effects of fixed-term contracts, Hagen (2002) finds a wage gap of between 6–10 per cent; which increases to 23 per cent once they control for selection on unobservables. The likely reason behind the larger gap when selection bias is corrected for is that unobservables (such as quality of worker, not captured by education, and experience observed) simultaneously increase the likelihood of an individual being a fixed-term worker and experiencing a wage disadvantage.

In general, much of the relevant literature has emanated from Europe, although there has been one NZ study[5] to deal with this research topic. Dixon (2011) uses the first wave of the data that is employed in this study (Survey of Working Life, 2008), Dixon provides some preliminary insights on the temporary workforce portrait in NZ. She also estimates the gap in average hourly earnings between temporary and permanent workers and initially finds a gap of 21 per cent, which can mostly be attributed to differences in demographic, occupation and industry characteristics. The only exception to this result was female casual workers, where even after adjusting for relevant covariates, this subgroup earned less than their counterparts in permanent jobs.

Another notable non-European study is that by Segal and Sullivan (1997), who focus on the temporary help services industry in the United States. The authors show the raw percentage difference between temporary and permanent wages to be approximately 22 per cent (although this varies substantially depending on which subgroup of workers the analysis focusses on – e.g. a raw difference of 13.4 per cent for white collar workers, and a 29.4 per cent difference for blue collar workers). After controlling for relevant observables, in terms of determinants of wages, the gap for the whole sample falls to just 3.1 per cent. The determinants controlled for in these specifications include factors such as age, gender, ethnicity and education, regional information and job and occupational characteristics.

It is also important to recognise that wage differences may not only be short term. Booth *et al.* (2002) find evidence of a substantial wage growth penalty associated with the experience of temporary employment. Based on data from the British Household Panel Survey from 1991 to 1997, the authors highlight that men who start their careers with a fixed-term contract suffer a long term earnings loss compared to men who enter the workforce in permanent positions. A more recent study by McGinnity *et al.* (2005) for Germany, also compare those who begin working life with a fixed-term contract versus permanent job, and find that the unemployment rates of these two groups converge after five years. The authors argue that starting your working life in a temporary contract may not be a 'bad start' after all.

Scherer (2004) argues that labour (im)mobility is key to assessing wage gaps for temporary workers (relative to their permanent counterparts) across countries. For example, she compared evidence between Germany, Great Britain, and Italy and found distinct differences in the magnitude of wage differences uncovered.[6] Great Britain exhibited the smallest wage gaps, potentially indicating less wage discrimination and/or also reflecting less labour market rigidity and immobility, and greater transferability of skills and qualifications across professions.

Jahn and Pozzoli (2013) add a further dimension to the empirical evidence by illustrating that the intensity of temporary work plays a role in determining the temporary-permanent wage gap. They define the treatment intensity as either the cumulative number or the duration of previous temporary jobs across the preceding five years. Within a panel framework they show that the wage disadvantage is high when treatment intensity is low, and decreases as the intensity level rises. They

5 Other works such as Ongley et al. (2013) are largely descriptive.
6 Gebel (2010) compared Germany and Great Britain and also found similar results.

speculate that this may be due to an accumulation of human capital the longer they work in the temporary sector.

More recently, a small number of studies have examined the extent of a wage disadvantage for temporary workers at not just the aggregate level, but also across the entire wage distribution. This accounts for the relative importance of observed characteristics and skills at varying levels of the wage distribution. Comi and Grasseni (2012) use data from nine European countries – Austria, Greece, Hungary, Ireland, Italy, Poland, Portugal, Spain, and the UK – and find a permanent wage premium in almost all countries sampled. This result was also consistent across the wage distribution, and suggested widespread discrimination against temporary workers. Further weight was placed on this argument when it was also found that the wage gap appeared to increase, with greater levels of employment protection for permanent jobs.

Bosio (2009) uses Italian data from 2006 and also examines how the wage gap differs across the wage distribution, by employing quantile regressions. He finds a wider wage gap at the bottom of the distribution (of approximately 30 per cent), which slowly decreases as movement is made toward the top of the wage distribution. A similar methodology was utilised in Mertens *et al.* (2007) with both Spanish and German data. The results show the lack of generalizability of findings from one country to another. At odds with the result from the Italian study, Mertens *et al.* (2007) show evidence of a relatively even wage penalty (for Spain) across the wage distribution.

With respect to the Australian context, Lass and Wooden (2017) use panel data to show that the wage difference between temporary and permanent workers not only varies across the distribution, but also depending on the type of temporary worker. They find evidence of a wage penalty for casual workers at the low end of the distribution, as well as a wage premium at the top end of the distribution. In comparison, they find little difference in pay between fixed-term contractors and permanent workers.

What inferences can be drawn from the empirical evidence thus far? It is important to control for observable characteristics, including the usual host of covariates that often explain wage levels. Labour market institutions are also important – and may play a mediating role in determining the existence and magnitude of a wage disadvantage for temporary workers. And finally, disaggregate analysis across the wage distribution is also necessary to better understand whether any unexplained wage gap varies across this distribution.

The following analysis will contribute to the growing empirical evidence on temporary-permanent wage gaps on two fronts. First, all the analysis in this paper is done for both the aggregate group of temporary workers, as well as for each of the subgroups. These disaggregate insights are an important contribution to the extant literature, as there is a lack of evidence with regard to some of these subgroups – such as casual workers, seasonal and temporary agency. Second, as almost all previous studies have shown – context is important. Therefore, investigating the potential incidence of unexplained wage differences between the temporary and permanent workforce in a country where EPL is extremely minimal, presents as a useful case study, with potential policy implications for those involved in debating the furtherance of loosening EPL across other OECD countries.

3 Data and Descriptive Statistics

This study makes use of pooled data from the two waves of Survey of Working Life (SoWL - 2008, 2012). These data are the first attempt in NZ to gather official statistics about the size of the temporary sector and a range of associated characteristics. In the one NZ study that examines the temporary–permanent wage gap, Dixon (2011) makes use of the first of these waves and presents important insights into the portrait of the temporary workforce in NZ. Prior to Dixon's paper, there was very little, if any concrete information on how many of NZ's workforce were employed in a temporary job. Campbell and Brosnan (2005) in a comparison of the casual workforce between Australia and NZ, lament the lack of data on size and nature of casuals in NZ, indicating there is limited case study research to fill the knowledge gaps. They rely on two phone surveys (in 1993 and 1997 by the Department of Labour) and their own workplace survey conducted in 1995 to arrive at a figure of around 11 per cent of the workforce as 'occasional', 'temporary' and 'fixed-term'. Dixon (2011) finds a similar proportion for 2008 of approximately 10 per cent.

The SoWL was carried out by Statistics NZ and was run as a supplement to the Household Labour Force Survey in 2008 and 2012. It collected information on a wide array of people's employment conditions, arrangements and quality of working life (in terms of flexibility, training and health and safety). Each employee was asked if they were employed on a permanent or temporary basis, and if it were the latter, they were then asked if their employment relationship could be classified as fixed-term, casual or temporary agency.

In this context fixed-term workers are those employees who are hired until a fixed date is reached or a project completed. Casual workers are those workers who only work when their employer asks them to, on an as-needed basis and do not have any guarantee of regular ongoing work. Temporary agency workers are employed through an employment agency and perform work at the premises of a third party. Lastly, seasonal workers are those whose job is only available at certain times of the year. The employment protection and minima applicable to temporary workers in NZ are generally low. While permanent employees also face minimal protection, temporary workers have reduced entitlements for sick and maternity leave, and the use of 90-day trial periods may be more likely to impact workers who move through a number of short term spells of employment with different employers. Unlike the Australian case casual workers do not attract a loading on their hourly pay except in some circumstances where casuals receive a loading of 8 per cent in lieu of holiday pay.

As Table 1 illustrates 1,614 of our sample are classified as temporary (which equates to approximately 9.5 per cent of the total sample). Just under half of the temporary workers were casuals, 28 per cent were fixed-term, around 13 per cent were seasonal and finally 8 per cent were classed as temporary agency workers. The asterisks in the 2nd column of the table (the temporary subgroup) reflects whether the differences in the means in that column, relative to the column to the left (the permanent subgroup) are statistically significant.

In general, it appears that workers on a temporary contract were more likely to be female (62 per cent), younger, and of Māori ethnicity (15 per cent). The picture in terms of educational attainment is not clear cut, with temporary workers less likely to have post-school qualifications (relative to their permanent counterparts), but also more likely to have a degree qualification. As shown in the third and fourth columns, where the temporary group is split up into fixed term contractors and all other forms of temporary workers, the mixed educational attainment picture for temporary workers is driven by the heterogenous nature of this group. In particular, it is clear that fixed term contractors have a significantly different educational profile to other forms of temporary workers. They are three times more likely to hold post graduate qualifications, and more than two and a half times more likely to have a university degree.

In terms of occupational characteristics, temporary workers were more likely to be labourers, and less likely to be managers (with these differences significant at the 1 per cent level). They were concentrated more in agriculture, forestry, fishing; accommodation and food services; or education and training, and were also more likely to be working part-time (49 per cent versus 19 per cent of permanent workers) and lack union representation.

Table 1: Definitions and descriptive statistics: Pooled 2008 & 2012 SoWL

Variable	*Definition*	*Means*			
		Permanent	*Temporary*	*Fixed-term*	*Other temporary*
Ln real hourly wage	Natural logarithm of average hourly earnings from main job (deflated by CPI)	3.010	2.813***	3.020	2.732***
Temporary	Dummy variable: 1 = temporary worker; 0 = permanent worker	-	1.000	1.000	1.000
Fixed-term	Dummy variable: 1 = fixed-term contractor; 0 = otherwise	-	0.283	1.000	-
Casual	Dummy variable: 1 = casual worker; 0 = otherwise	-	0.496	-	0.698
Temporary agency	Dummy variable: 1 = temporary agency worker; 0 = otherwise	-	0.081	-	0.114
Seasonal	Dummy variable: 1 = seasonal worker; 0 = otherwise	-	0.134	-	0.188
Personal characteristics					
Male	Dummy variable: 1 = Male; 0 otherwise	0.476	0.378***	0.316	0.402***
Age	Age in years	41.041	36.820***	37.781	36.448*
NZ European	Dummy variable: 1 = NZ European; 0 otherwise	0.791	0.752***	0.811	0.733***
Māori	Dummy variable: 1 = Māori ; 0 otherwise	0.112	0.143***	0.114	0.152*
Pacific	Dummy variable: 1 = Pacific peoples; 0 otherwise	0.057	0.061	0.035	0.072***
Asian	Dummy variable: 1 = Asian; 0 otherwise	0.083	0.087	0.088	0.086
Melaa	Dummy variable: 1 = Middle Eastern, Latin American or African; 0 otherwise	0.006	0.011**	0.004	0.013
Other ethnicity	Dummy variable: 1 = ethnicity not listed above; 0 otherwise	0.017	0.022	0.013	0.024
No school qual	Dummy variable: 1 = highest education is below high school; 0 otherwise	0.257	0.260	0.132	0.310***
School qual	Dummy variable: 1 = highest education is school qualifications; 0 otherwise	0.147	0.206	0.147	0.230***
Post school qual	Dummy variable: 1 = highest education is post school qualifications[1]; 0 otherwise	0.394	0.317***	0.318	0.316
University	Dummy variable: 1 = highest education is a university degree; 0 otherwise	0.137	0.148***	0.265	0.103***
Post grad	Dummy variable: 1 = highest education is a post graduate qualification; 0 otherwise	0.065	0.069	0.138	0.041***
Non-immigrant	Dummy variable: 1 = born in NZ; 0 otherwise	0.764	0.769	0.724	0.787***
Immigrant ≤ 5 years	Dummy variable:1 = Not born in NZ & lived in NZ ≤ 5 years; 0 otherwise	0.075	0.077	0.105	0.066***

Immigrant > 5, ≤ 10 years	Dummy variable: 1 = Not born in NZ & lived in NZ > 5 years & ≤ 10 years; 0 otherwise	0.040	0.045	0.039	0.048
Immigrant > 10 years	Dummy variable: 1 = Not born in NZ & lived in NZ >10 years; 0 otherwise	0.121	0.108	0.132	0.098**
Occupational characteristics (ANZSCO level 1)					
Dummy variables (8):	1 = Managers; 0 otherwise	0.133	0.050***	0.068	0.044*
	1 = Professionals; 0 otherwise	0.140	0.138	0.281	0.080***
	1 = Technicians and Trades Workers; 0 otherwise	0.153	0.110***	0.182	0.081***
	1 = Community and Personal Service Workers; 0 otherwise	0.143	0.155	0.167	0.150
	1 = Clerical and Administrative Workers; 0 otherwise	0.128	0.142	0.114	0.154**
	1 = Sales Workers; 0 otherwise	0.109	0.116	0.064	0.138***
	1 = Machinery Operators and Drivers; 0 otherwise	0.082	0.051***	0.033	0.058**
	1 = Labourers; 0 otherwise	0.112	0.239***	0.092	0.295***
Industry classifications (ANZSIC level 1)					
Dummy variables (19):	1 = Agriculture, forestry, fishing and hunting; 0 otherwise	0.040	0.104***	0.042	0.129***
	1 = Mining; 0 otherwise	0.004	0.001*	0.002	0.001
	1 = Manufacturing; 0 otherwise	0.140	0.138	0.118	0.145
	1 = Electricity, gas and water supply; 0 otherwise	0.008	0.002**	0.007	0.001**
	1 = Construction; 0 otherwise	0.069	0.037***	0.031	0.040
	1 = Wholesale trade; 0 otherwise	0.052	0.030***	0.029	0.031
	1 = Retail trade; 0 otherwise	0.132	0.090***	0.070	0.098*
	1 = Accommodation and Food Services; 0 otherwise	0.050	0.081***	0.026	0.102***
	1 = Transport and storage; 0 otherwise	0.043	0.028***	0.088	0.034**
	1 = Information Media and Telecommunications; 0 otherwise	0.016	0.012	0.011	0.012
	1 = Finance and Insurance; 0 otherwise	0.032	0.012***	0.015	0.010
	1 = Rental, Hiring and Real Estate Services; 0 otherwise	0.053	0.042*	0.026	0.049**
	1 = Professional, Scientific and Technical Services; 0 otherwise	0.050	0.037**	0.059	0.028***
	1 = Administrative and Support Services; 0 otherwise	0.036	0.095***	0.099	0.094

	1 = Public Administration and Safety; 0 otherwise	0.080	0.067*	0.094	0.057***
	1 = Education and Training; 0 otherwise	0.066	0.126***	0.024	0.082***
	1 = Healthcare and Social Assistance; 0 otherwise	0.101	0.069***	0.092	0.060**
	1 = Arts and Recreation Services; 0 otherwise	0.008	0.015***	0.011	0.017
	1 = Other Services; 0 otherwise	0.021	0.014*	0.022	0.010**
Other job related characteristics					
Union member	Dummy variable: 1 = union member; 0 otherwise	0.170	0.134***	0.193	0.112***
Tenure	Tenure in current job (weeks)	320.11	124.80***	97.669	135.754***
Part time	Dummy variable: 1 = working part time (less than 30 hours in main job); 0 otherwise	0.193	0.489***	0.336	0.548***
Household characteristics					
Sole parent	Dummy variable: 1 if sole parent; 0 otherwise	0.050	0.069***	0.054	0.074
Children under 6	Number of children in household under the age of 6	0.266	0.250	0.254	0.248
Children 6 to 16	Number of children in household aged more than 5 and less than 16	0.749	0.729	0.695	0.740
Sample size		15,342	1,614	456	1,149

Notes: ***, ** and * reflect significance of the differences between the temporary and permanent subgroups (in column 2) and significance of the differences between fixed term contractors and other forms of temporary workers (in column 4), at the 1%, 5% and 10% level respectively. The sample sizes have been randomly rounded to base 3 due to confidentiality requirements by Statistics NZ.

5 Empirical analysis

5.1 Decomposing the temporary–permanent wage gap

As indicated in Table 1, temporary employees receive a lower average hourly wage than their permanent counterparts. Converting the real hourly wage (in natural log terms) back into dollars shows that the figure for an average temporary employee is $16.66, and for a permanent employee is $20.29.

The hourly wage here is taken from the response to the SoWL question 'what was your basic, ordinary time hourly rate last week?' i.e. it is the base wage of the employee before tax and excluding overtime.

Decomposing the raw wage gap can be done via the Blinder-Oaxaca procedure (Blinder, 1973; Oaxaca, 1973), which splits the wage differential into two components. These are the 'explained part' (i.e. the proportion of the raw wage gap that can be explained by observable covariates included in the model) and the 'unexplained part' (which is routinely used as a proxy for discrimination). We begin our analysis with trialling five separate models (labelled A – E in Table 2), each of which subsequently adds further covariates. Model A includes just personal characteristics, such as age, ethnicity, educational attainment, and immigrant status; Model B includes the covariates from Model A, and adds occupational characteristics; Model C controls for industry sector in an additive manner; and Model D includes all aforementioned variables, and other job related characteristics, such as union status, tenure, and a dummy for being a part timer. Occupational and industry controls capture measures of both vertical and horizontal labour market segmentation respectively, by controlling for the particular distribution of temporary jobs across different occupations and sectors of the economy. Finally, Model E includes all controls listed for Model D and adds in household characteristics related to family structure and age and number of children.

The two-fold decomposition can be expressed by the following equation:

$$\overline{w}_P - \overline{w}_T = (\bar{x}_P - \bar{x}_T)\hat{\beta}_P + \bar{x}_T(\hat{\beta}_P - \hat{\beta}_T) \quad (1)$$

Where $\overline{w}_P$ and $\overline{w}_T$ are the predicted means of log hourly wages for permanent and temporary workers respectively; the first part of the right hand side of equation (1) is the explained proportion of the wage differential ($\bar{x}_P$ and $\bar{x}_T$ are the average values of covariates for each category of worker and $\hat{\beta}_P$ and $\hat{\beta}_T$ are the estimated parameters); and the second part of the right hand side of equation (1) captures the unexplained proportion of the wage gap. A positive value for this second part will represent a temporary wage disadvantage. Of course, we must also acknowledge that while this may represent wage discrimination against temporary workers, it may also reflect differences in unobserved or omitted characteristics for both categories of workers.

As Table 2 illustrates, the wage gap (regardless of the model employed – from model A to E) equates to approximately an 18–20 per cent temporary wage gap. It is evident from Table 2 that moving from Model A through to E, results in an increasing proportion of the wage gap being explained. At first, when only personal characteristics are controlled for (in model A), just 41.81 per cent of the wage gap

is explained (7.81 per cent points out of a 18.68 per cent pay gap); and by time we arrive at Model E, where personal, occupation, industry, other job characteristics and household information are accounted for, the explained proportion rises to just under 91 per cent (17.85 per cent points out of a 19.65 per cent pay gap). It is important to note that industry, occupation and other job-related characteristics account for a sizeable proportion of the gap – at just under 50 per cent. This corresponds with the argument that it is segmentation across the labour market (both horizontal and vertical) that is driving wage differences between temporary and permanent workers, more so than individual and household characteristics.

Table 2: Blinder-Oaxaca decomposition, dependent variable = ln real hourly wage

	Explained (%)	*Unexplained (%)*
Model (A): With only personal characteristics Overall pay gap = 18.68% ***	7.81***	10.88***
Model (B): Model (A) + occupation controls Overall pay gap = 18.68% ***	11.31***	7.37***
Model (C): Model (B) + industry sector controls Overall pay gap = 18.68% ***	12.70***	5.98***
Model (D): Model (C) + other job related characteristics Overall pay gap = 19.65% ***	17.66***	1.99**
Model (E) – Model (D) + household characteristics Overall pay gap = 19.65%***	17.85***	1.80**

Note: *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively. *N = 16,953*

At this point it is important to note that temporary employment in NZ encompasses a diverse range of jobs, with fixed-term workers being very similar to permanent employees, and distinctly different to casual/temporary agency, or seasonal workers. We therefore repeat the decomposition (via the full specification in Model E) for the various categories of temporary worker versus permanent employment, and these results are portrayed in Table 3.

Table 3: Blinder-Oaxaca decomposition for different types of temporary employment
Dependent variable = ln real hourly wage

	Overall pay gap (%)	*Explained (%)*	*Unexplained (%)*
All temporary	19.65***	17. 85***	1.80***
Fixed-term	-1.01	2.08	-3.09*
Casual	30.35***	26.07***	4.27***
Temporary agency	27.03***	20.64***	6.39**
Seasonal	18.41***	18.65***	-0.24

Note: *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

There are several noteworthy findings in Table 3. To begin with fixed-term workers appear to be paid more than permanent workers (after controlling for all relevant covariates) – although this difference is small and statistically insignificant. For seasonal workers, the wage gap is similar to that of the aggregate group of temporary workers and is completely explained by observable characteristics. The unexplained component for the seasonal subgroup equates to just -0.24 per cent and is statistically insignificant.

The largest wage gaps (with respect to permanent workers) are for casual and temporary agency workers, with gaps of 30.35 per cent and 27.03 per cent respectively. Although, in a similar fashion to the aggregate group of temporary workers, a sizeable proportion of the gap can be explained. The relevant proportions are 85.90 per cent for casuals and 76.34 per cent for temporary agency workers.

The findings from Table 2 and 3 illustrate that aside from fixed-term workers (where there is no gap), for all other types of temporary employment (where the wage gap ranges from 18 to 30 per cent), the majority of the temporary-permanent wage gap can be explained by observable characteristics. These characteristics cover a wide array of individual, household, industry, occupation, and other job characteristics.

There are of course a couple of caveats that must accompany these results to hint at the potential limitations of the specifications utilised in both Table 2 and 3. The first limitation is the classical problem of sample selection bias (Heckman, 1979). The wage is observed only for those who participate in the labour market, and as a consequence the sample observed may not represent the true underlying population. The decision to enter the labour market may be correlated with an individual's potential wages, meaning that any analysis that is limited to just the employed may be potentially biased. Problematically though, to correct for this potential selection bias, we need to observe those who would be temporary and permanent workers outside the labour market. In the traditional applications of Heckman's correction, the two groups often compared are men and women, and as such it is easy to see which group they belong to, regardless of whether they are in or out of the labour market. Unfortunately, the same cannot be said for temporary

versus permanent workers.[7]

The second limitation with these decomposition results are endogeneity related. The choice of working in temporary or permanent employment is not exogenous. However, to deal with accounting for endogenous selection we need an adequate set of instruments to identify the selection effects. One example of a potential instrument (as used by Picchio (2006); and Bosio (2009)) is a job search variable. An indicator of searching for another job may be positively correlated to the type of employment contract, as temporary employees could have a higher likelihood of searching for a role to replace their temporary contract. Unfortunately, we do not have a similar variable in the SoWL, and find no valid instrument in our data.

Lastly, in addition to the problem of endogeneity, coefficient estimates maybe biased through the omission of unobserved variables such as intelligence or motivation that are likely to play a role in the determination of an individual's wage. While techniques, such as panel models, exist that can account to some extent for this we are limited here by the pooled cross sectional nature of our data (Belbo *et al.*, 2003).

With these caveats in mind, we must be careful not to make any causal inferences from our decomposition analysis. Instead, we should focus on the contributions of these methods in providing further insights for subgroups of the temporary workforce, beyond the aggregate group of temporary workers, or only fixed-term contracts, which are common in the past literature.

5.2 Quantile Decomposition

In the previous section we relied on the Blinder-Oaxaca decomposition to explore the unexplained wage gap between temporary and permanent workers, without considering how the magnitude of this gap may vary at the lower or upper ends of the wage distribution. It would seem plausible to hypothesise that the size of the gap will vary across the wage distribution due to the possible existence of both 'sticky floors' and 'glass ceilings' (Albrecht *et al.*, 2003; Arulampalam *et al.*, 2007; and Carillo *et al.*, 2014). These terms reflect situations where the wage disadvantage for temporary workers is wider at the top and bottom of the wage distribution, respectively.

To investigate this further, we performed an unconditional quantile regression using an approach by Firpo, Fortin and Lemieux (2009). This is essentially a generalisation of the Blinder-Oaxaca decomposition for quantile regressions to assess the wage disadvantage at various points in the wage distribution (10 percentile cut-offs). Table 5 reports the results of this analysis, where the explained component is the part of the pay gap at the relevant quantile of the log wage distribution that can be explained by differences in the means of the explanatory variables (as described in the full specification of Model E) between temporary and permanent workers. The unexplained component is the part of the total gap that cannot be explained, and reflects differences in returns on attributes.

7 It would also be difficult to hypothesise whether we expect this sample selection bias to be positive or negative with respect to our calculated wage gaps between temporary and permanent workers.

Table 5 : Quantile Regression Decomposition, Percentage Wage Gap.

Percentile	*All Temporary*		*Fixed-term*		*Casual*		*Temporary agency*		*Seasonal*	
	Explained	*Unexplained*	*Explained*	*Unexplained*	*Explained*	*Unexplained*	*Explained*	*Unexplained*	*Explained*	*Unexplained*
10	11.11***	-6.99***	2.66***	-1.42	16.74***	-7.93***	9.71***	-5.97***	8.75***	-5.25**
20	17.47***	-6.79***	4.47***	-3.26*	26.32***	-14.16***	15.73***	-6.25***	12.77***	-7.51***
30	21.40***	-5.38***	2.94	-2.23	32.13***	-12.48***	20.58***	-3.65	16.55***	-5.40**
40	21.93***	1.04	3.88***	-2.79	32.59***	-4.99***	23.71***	0.07	18.94***	-4.29
50	21.63***	2.82**	3.97	-3.95	32.16***	1.71	25.11***	3.89	20.88***	-3.20
60	21.06***	5.37***	2.77	-2.35	30.89***	8.47***	26.93***	7.76**	22.03***	-1.14
70	19.68***	9.91***	3.13	-0.77	28.63***	13.93***	27.08***	12.47***	23.15***	-0.31
80	19.04***	6.99***	1.41	5.04	27.38***	17.06***	27.02***	19.43***	25.01***	3.54
90	17.38***	6.52**	0.04	4.58	23.22***	24.34***	22.39***	23.08*	25.87***	8.02*

Note: *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

For temporary workers as a whole the predicted wage gap is significant across the whole wage distribution and increases until the 70th percentile before the gap begins to narrow slightly. With the gap generally rising as we move up the wage distribution, this would seem to offer some support to the 'glass ceiling' interpretation. Additionally, the unexplained proportion of the gap is higher towards the top end of the distribution, peaking at 33.5 per cent of the total gap at the 70th percentile, before falling a little to the 27 per cent mark at the 80th and 90th percentile.

For fixed-term employment the gap is significant at the bottom end of the wage distribution (10th, 20th and 40th percentile), and insignificant across the rest of the distribution. However, it is economically small, averaging at approximately 1 per cent, indicating a slight 'sticky floor'. Although it is, of course, worth noting, that this gap is fully explained by observable characteristics.

In terms of comparing the first two sets of results from Table 5 (i.e. all temporary and fixed-term workers) with the international evidence, there are a handful of possible studies to draw on. Mertens *et al.* (2007) found mixed results, with very little variation in the wage gap across the wage distribution, when they compared fixed-term contracts with permanent workers in Spain; and larger pay gaps evident for the lowest earners in Germany. Bosio (2009) also found wider wage gaps at the bottom end of the distribution for fixed-term workers in Italy. While our results for the fixed-term subset of temporary workers indicate a larger gap at the bottom end of the distribution, it is almost fully explained by observables. As such the size of the unexplained gap is actually stable across the wage distribution, and usually statistically insignificant. This is similar to the finding by Lass and Wooden (2017) for Australia, that the wages for fixed-term contract workers (regardless of gender) do not differ significantly to those of permanent workers throughout the majority of the wage distribution.

It is useful to point out here that one reason why we find no evidence of wider gaps at the bottom of the wage distribution (as found in the European based analysis) may be related to the minimum wage framework in NZ.[8] The most recent statistics from the OECD (based on 2013) show that the minimum wage in NZ is 60 per cent of the median wage of full time employees.[9] Only four other countries had a higher relative minimum wage ratio. For instance, if comparing NZ with the United Kingdom, as both have similarly low levels of EPL, the comparable relative minimum wage ratio for the United Kingdom was 47 per cent in 2013. At the low end of the scale was the United States, with a relative minimum wage of 37 per cent. The high relative minimum wage ratio in NZ means that despite low EPL for temporary workers, employers have very little wiggle room at the bottom end of the wage distribution if attempting to discriminate against the temporary workforce. This may explain why the pay gap is smaller at the lower end of the wage distribution.

With regard to the distributive role for casual, temporary agency or seasonal workers, Table 5 shows the results for the casual and temporary agency subgroups

8 Holmlund (2014) argues that EPL is just one of three key labour market institutions that shape labour market outcomes. The other two are minimum wages and unemployment insurance.

9 See OECD (2015b). Based on the minimum wage (sourced from Statistics NZ), and median wage = median usual weekly earnings of full time employees (sourced from the Household Economic Survey, Statistics NZ)

(which are very similar to each other) stand out relative to the other forms of temporary employment. Their pay gap (with permanent workers) grows markedly from the 10th to the 90th percentile. For instance, for casual workers, the gap starts at 8.81 per cent at the 10th percentile, and grows to 47.56 per cent by the 90th percentile. Additionally, the unexplained element for the casual-permanent gap is negative at the start of the wage distribution, and steadily rises to equate to just over half of the total gap by the end of the distribution. A similar pattern is evident for temporary agency workers.

There is a definite lack of comparable studies in the international literature to compare with these particular findings. However, recent work by Lass and Wooden (2017), who conduct similar analysis within the Australian context for casual and temporary agency workers, found evidence of a wage penalty for casual workers at the low end of the distribution, as well as a wage premium at the top end of the distribution. For temporary agency workers, they find no difference at the bottom of the distribution, and a large premium at the top end of the distribution. These results are at odds with the findings within the NZ context and may indicate that these are two types of employment contract that warrant deeper investigation in future work, to better understand possible reasons for the 'glass ceiling' effect found.[10]

For the final group of seasonal employment, while the gap does increase with a movement up the wage distribution, the aggregate average results from Table 3 for seasonal workers are for the most part retained in terms of the gap usually being explained by observable characteristics.

6 Conclusions

In this paper, we investigate the wage gap between the temporary and permanent workforce, using NZ micro data. Beginning with the standard Blinder-Oaxaca decomposition we show that once relevant observables (in terms of personal, household, occupational, industry and other job characteristics) are controlled for, and in essence these particular endowments of temporary workers are raised to the levels held by permanent workers, the majority of the wage gap can be explained (with just 9.2 per cent unexplained). While noting the exception of fixed-term workers (where there was no evident gap with permanent workers), the general results for the aggregate groups of temporary workers held for the subgroups of casual, seasonal and temporary agency workers. The largest values for the unexplained proportions were 14.1 per cent for casual workers, and 23.6 per cent for temporary agency workers.

Interestingly we find that labour market segmentation accounted for more of the explained wage gap, compared to personal and household characteristics of the worker, indicating the importance of occupation, industry, and other job characteristics.

The second part of the empirical analysis in this paper involved investigating the distributive aspect of the temporary-permanent wage gap via quantile analysis. For most cases, the wage gap grows as we move towards the top end of the wage distribution, lending support for the 'glass ceiling' interpretation. This is particularly

10 These results should also be interpreted with the caveat that they are based on small sample sizes – as shown in Table 1, temporary agency and casual workers constitute just 8% and 28% of the temporary workforce, respectively.

evident for casual and temporary agency workers. Additionally, these two subgroups stand out from the rest in terms of not just the raw gap itself growing, but also the sizeable growth in the unexplained proportion of the gap. For both subgroups, half of the wage gap is unexplained at the 90th percentile in the distribution. Such workers are often used as a 'buffer stock', the insider/outsider argument may be most relevant here, with these workers treated as outsiders, and therefore having the least protection, and bargaining power; translating into a higher probability of wage discrimination.

What are the relevant future research avenues from here? First, it is important to recognise that throughout this empirical endeavour we are essentially assuming that similar levels of qualifications, skills, and tenure should equate to similar outputs in terms of worker productivity. However, it could be argued that temporary workers (and in particular, casual workers) lack the requisite organizational specific knowledge and firm-specific social capital, and that this results in lower productivity relative to observably similar permanent workers. Also, permanent workers could have higher levels of unobserved quality that also results in higher productivity levels for this group, relative to the temporary subgroup. Therefore, future research that utilises linked employer-employee data could extract worker quality via fixed effects at the employee-level, for the purposes of holding constant in any wage differential analysis.

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(Footnotes)

1 This category includes those with a university certificate or diploma, a teacher's certificate or diploma, a polytechnic certificate or diploma, a nursing certificate or diploma, a trade certificate, other post school qualifications and post school qualifications of an unspecified nature.

Occupational Mobility of Indigenous and Other Australians

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Abstract

This paper describes Indigenous and non-Indigenous occupational mobility (i.e. changes in the skill level of an occupation in which an individual is employed) using the Australian Census Longitudinal Dataset, 2006–11. The paper also considers movements out of paid employment, by occupation, and the occupations in which people who move into employment are employed. The main finding is that Indigenous people are more likely than non-Indigenous people to enter the labour market through low-skill jobs, and to have greater downward mobility because they are more likely than non-Indigenous people to leave employment from the highest skill occupations. For those who are employed at successive censuses, there is not a great deal of difference in Indigenous and non-Indigenous patterns of occupational mobility. By analysing the flows into and out of particular occupations, this paper also attempts to broaden the understanding of job retention rates. We explore some interpretations of this data using recent literature on job polarisation and routinisation of work.

Keywords: occupation mobility; Indigenous; labour market
JEL: J15, J24, J78

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1. Introduction

There is evidence that changes in the distribution of employment by occupation, and average earnings by occupation explain substantially more of the rise in earnings inequality than factors such as age and education attainment (Borland and Coelli 2016). In another article, Coelli and Borland (2016) also identify the significance of the phenomenon of job polarisation, whereby there is an increase in the share of employment in high-skill jobs, a decrease in the share in middle-skill jobs and an increase in the share in low-skill jobs.[1] Borland and Coelli's research highlights the importance of policy that considers the types of jobs held by Indigenous people. This paper describes the types of occupations Indigenous and other Australians are employed in and how people change occupational and labour force status over time.

Job polarisation has been driven by the loss of jobs that were high in routine task intensity, and has primarily affected men (Autor et al. 2003, Autor and Dorn 2013). New technologies are replacing routine cognitive and manual tasks previously undertaken by middle skilled workers. Computer technology has been complementary to cognitive and interactive tasks undertaken by highly skilled workers, raising their productivity and, in turn, demand for these workers. Historically, at least until the recent past, nonroutine manual tasks have been less amenable to being substituted by machines and technology. Goos et al. (2014) argue that, in addition to the role of (routine-biased) technological change, offshoring jobs in cheaper labour markets can partially explain job polarisation.

These trends have potentially important implications for Indigenous labour force status, given that Indigenous employees are much more likely to be in low-skilled occupations than are non-Indigenous Australians, and are therefore in jobs that are more likely to be lost from the economy. Increases in Indigenous employment will require Indigenous workers to acquire the skills needed for occupations that are likely to be demanded in the future.

Although detailed data are available on the occupations in which the Indigenous population work and how this occupational distribution is changing over time, there is little empirical evidence on transitions between occupations for the Indigenous population. This paper uses data from the Australian Census Longitudinal Dataset (ACLD), which links the 2006 and 2011 censuses for a subsample of the population, to analyse transitions into and out of low-skilled occupations for the Indigenous population, and how this compares with transitions of the non-Indigenous population.

Previous analysis of the 2006 and 2011 censuses by Gray et al. (2014) shows that the overall occupational distribution of Indigenous workers in nonremote areas was similar in 2006 and 2011. Modest shifts occurred in occupational structure away from labourers and towards community and personal service workers for females, and towards technical and trades workers for males. The occupational distribution of non-Indigenous workers also remained relatively constant between 2006 and 2011, with the exception of a shift away from managerial positions in remote areas, perhaps reflecting the weakening of the agricultural sector.

This paper uses the standard ABS (Australian Bureau of Statistics) occupational classifications in conjunction with a related classification developed by the ABS – occupational skill level.

The next section describes key features of the ACLD relevant to the analysis presented in this paper, and analyses the definition of occupational skill level and its relationship to the broad occupation categories. The main results are presented as transitions between selected labour force states characterised by the skill level of occupations. The policy discussion in the final section reflects on the implications of the findings and looks to future productive policy and research directions from occupational data that becomes available late in 2017.

2. Data

2.1 Australian Census Longitudinal Dataset

The ACLD uses data linkage techniques to link responses to the 2006 Census by a 5% random sample of respondents with their responses to the 2011 Census. The ACLD 2006–11 includes 800 759 individuals of whom 14,802 identified as being Indigenous in 2006. This forms the largest available longitudinal dataset of Indigenous Australians (ABS 2013). Indigenous identification changed substantially between 2006 and 2011 among the linked sample. Of those who identified as being Indigenous in 2006, 9.2% identified as being non-Indigenous in 2011 and 1.1% did not state their Indigenous status. Of those who identified as being non-Indigenous in 2006, 0.2% identified as Indigenous in 2011 and 0.9% did not state a response (ABS 2013). The instability in the identification of Indigenous status presents a challenge for analysis and interpretation of the data, particularly when trying to compare changes over time from two cross-sectional datasets. One advantage of the ACLD is that the group of individuals whose characteristics and outcomes are being compared over time can be held constant. In this paper, we have defined Indigenous status as measured by the 2006 Census.[2]

The main analysis is restricted to people aged 20–59 years in 2006, to ensure that all respondents were in the working-age population in both 2006 and 2011, and so that we could focus on the post-secondary school population.[3] A separate analysis for those aged 15–24 years and 25–59 years in 2006 examines the main period of transition from formal education into the labour market.

Census data on Indigenous employment is complicated by the inconsistent and incomplete coverage of participants in the Community Development Employment Projects (CDEP) scheme. CDEP tends to be underreported in census collections because information on participants was only being collected in some remote areas; furthermore, there is considerable uncertainty about how remote CDEP participants may have reported their CDEP and employment status in the census. Comparisons of changes in occupation over time are further complicated for Indigenous Australians by the substanital reduction in the number of CDEP participants since 2006 (Hunter and Gray 2013a). To the extent that CDEP was identified as employment in census data in the period covered in this paper, it is almost entirely concentrated in lower-skilled occupations (skill level 5). If the person was affected by the reduction in the number of CDEP places between 2006 and 2011, and the former participant was not able to find non-CDEP employment by the time of the 2011 Census, then this person is most likely to be represented in the transitions from low-skilled occupations to non-employment.

2.2 Issues for measuring occupation over time

One of the challenges in analysing occupational mobility is changes over time in the categorisation of occupations by the ABS. Changes to the categories reflect changes in occupations that are found in the economy and changing skill composition of jobs. Between 2006 and 2011, the Australian and New Zealand Standard Classification of Occupations (ANZSCO) was revised, with new occupations added and changes to the titles and definitions of some existing occupations (ABS 2009).

However, a strength of the ACLD for estimating occupational mobility is that the 2006 and 2011 censuses include data on the skill levels of occupations that are comparable between censuses. For the reasons outlined above, and consistent with the international literature on job polarisation, the analysis in this paper is based on occupational skill level.

The discussion of the definition of occupations in this section draws heavily on the *ANZSCO* (ABS 2006). An occupation can be defined as a set of jobs whose main tasks are characterised by a high degree of similarity. The similarity of tasks is defined in ANZSCO as being a function of the level and specialisation of skill required to do those tasks. Within the ANZSCO framework akill level is defined by the range and complexity of the set of tasks done in a particular occupation. The greater the range and complexity of the set of tasks, the greater the skill level of an occupation. In practice, skill level is determined by a range of factors including: (i) the level or amount of formal education and training, the amount of previous experience in a related occupation, and the amount of on-the-job training required to competently do the tasks required for that occupation; and (ii) the degree of specialisation required to do the job.

In general, the greater the range and complexity of the tasks involved, the greater the amount of formal education and training, previous experience and on-the-job training required to competently do the tasks for that occupation. Specialisation is defined as a function of the field of knowledge required, tools and equipment used, materials worked on, and goods or services produced or provided.[4]

ANZSCO assigns respondent's occupations to one of five skill levels (see Table 1). For example, occupations at skill level 1 (the highest skill level) have a level of skill commensurate with a bachelor degree or higher qualification. In some instances, relevant experience and/or on-the-job training may be required in addition to the formal qualification. To be classified as having skill level 1, a person must have at least five years of relevant experience that substitute for the formal bachelor degree (or higher) qualification requirement.

Table 1. Summary of the relationship between occupational skill level, educational qualification and relevant work experience

Skill level	*Commensurate qualification*	*Work experience that formal qualification may be substituted by*
1 (highest)	Bachelor degree or higher	At least five years
2	Associate degree/diploma	At least three years
3	Certificate IV/Certificate III	At least two years
4	Certificate III/Certificate II	At least one year
5 (lowest)	Certificate I or compulsory secondary education	Not applicable

Note: In some instances, relevant experience and/or on-the-job training may be required in addition to a formal qualification.
Source: ABS (2006)

ANZSCO defines eight major occupations groups (one-digit level) that are formed by grouping together submajor occupational groups (two-digit level) using aspects of skill level and skill specialisation. Although almost all the more detailed disaggregated occupations classifications in ANZSCO have only one skill level, the 1-digit occupations contain jobs with more than one skill level. It is important to bear in mind that occupational classifications do not measure the skill level of an individual – rather, they relate to the level of skill that is typically required to competently perform the tasks of a particular occupation.

Table 2 illustrates the relationship between ANZSCO one-digit occupations and occupational skill levels using occupation data coded by the ABS. Professionals are uniformly highly skilled and a lot of work experience is required to substitute for educational qualifications, whereas managers are more heterogeneous with just over one-third having skill level 2. Labourers tend to be the least skilled group, with the vast majority having skill level 5. The other occupations tend to have a range of skill requirements.

While occupations change over time, skill levels provide a clear link to the productivity of work and tasks, and the likely policy options that involve the development of general skills through educational qualifications.

Table 2. The relationship between occupation and skill level, 2011

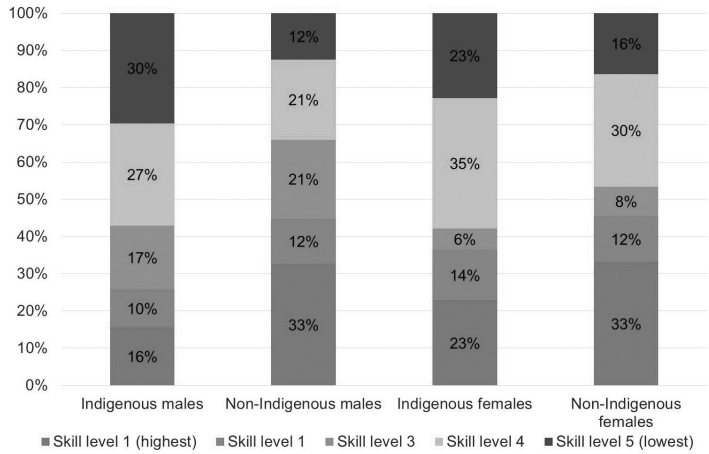
Occupation	*Skill level*					*Total (%)*	*Total (000s)*
	1	*2*	*3*	*4*	*5*		
Managers	65	35	0	0	0	100	1270
Professionals	99	1	0	0	0	100	2147
Technicians and trades workers	0	20	80	0	0	100	1380
Community and personal service workers	0	18	9	66	7	100	872
Clerical and administrative workers	0	17	9	69	6	100	1448
Sales workers	0	0	10	21	69	100	736
Machinery operators and drivers	0	0	0	100	0	100	637
Labourers	0	0	0	12	88	100	787
Total	31	12	15	26	14	100	9431

Notes: Population aged 25–64 years in 2011. Skill level 1 is the highest; skill level 5 is the lowest.
Row percentages do not necessarily add to 100 due to rounding error.
Source: ACLD 2006–11

3. The dynamics of occupational skill level of Indigenous and non-Indigenous Australians

This section provides a longitudinal analysis of changes in occupational skill level and labour force status between recent censuses according to Indigenous status, gender and broad age group. Before attempting any analysis of occupational mobility, we need to understand the distribution of occupations in 2006. In 2006, Indigenous workers were overrepresented in the relatively low-skilled occupations, especially labourers, and underrepresented in the high-skilled occupations, such as managers and professionals. This pattern is consistent with the analysis of Hunter (2004) based on data from the 2001 Census. Information on occupational skill level identified in the 2006 Census confirms this pattern (Fig. 1). Although both a higher proportion of employed Indigenous men and womenwere in low-skilled jobs compared with their non-Indigenous counterparts, the extent of concentration is greater for Indigenous men than Indigenous women. Employed Indigenous men and women were also underrepresented in the highest skilled jobs compared with other Australians. It is important to note that more than half of the Indigenous workers were employed in the middle three categories of occupational skill categories. While this group can sometimes be ignored in the public debate, these workers are highly likely to be affected by the long-run trend to job polarisation and the routinisation of work.

Fig 1. Occupational skill level of employment, by gender and Indigenous status, 2006



Notes: ACLD linked longitudinal sample for people aged 20–59 years in 2006. Estimates based on data weighted to estimated residential populations.
Source: ACLD 2006–11, Australian Bureau of Statistics Data Analyser

Data for individuals' occupational skill level and labour force status in 2011 according to their occupational skill level in 2006 is given in Table 3. The 2006 population in Table 3 is restricted to those who were employed. The inclusion of a column for not employed in 2011 means that the table is capturing both occupational mobility for people who were employed in 2006 and 2011 and those who were employed in 2006 and not employed in 2011. Appendix A provides information on occupational mobility for people who were employed in 2006 and 2011.

Table 3. Occupational skill level in 2006, by occupational skill level and non-employment status in 2011 (%)

		Occupational skill level 2011							
Indigenous status 2006	*Occupational skill level 2006*	*1*	*2*	*3*	*4*	*5*	*Not employed (%)*	*Total (%)*	*Unweighted count*
Indigenous males	1	48	13	3	9	4	23	100	241
	2	20	41	4	12	3	20	100	152
	3	10	6	51	10	8	15	100	271
	4	8	5	5	52	10	19	100	413
	5	8	2	6	16	37	30	100	412
Non-Indigenous males	1	70	8	5	7	3	8	100	52 309
	2	23	42	8	11	6	9	100	19 515
	3	9	7	61	9	6	9	100	34 233
	4	12	7	7	54	9	11	100	34 139
	5	10	7	10	19	41	14	100	19 517
Indigenous females	1	59	9	1	9	3	18	100	373
	2	19	34	2	17	6	22	100	207
	3	8	14	31	20	9	19	100	89
	4	14	10	1	44	7	24	100	550
	5	5	3	2	13	35	43	100	333
Non-Indigenous females	1	69	6	2	8	2	12	100	46 887
	2	18	37	4	19	7	15	100	17 521
	3	9	10	38	18	6	18	100	11 325
	4	11	9	4	52	7	17	100	42 765
	5	5	6	3	17	46	22	100	22 773

Notes: See Fig. 1. The 2006 population is restricted to those who were employed in 2006.
Sources: ACLD 2006–11, Data Analyser

An example in interpreting the table is as follows. For Indigenous males employed in a job with an occupational skill level of 1 in 2006 (the highest level of occupational skill), and who were still employed at the time of the 2011 Census, 48% remained in a job with a skill level of 1, 13% were in skill level 2 job, 3% in a skill level 3 job, 9% in a skill level 4 job and 4% in a skill level 5 job. Of the males who were in the highest occupational skill category in 2006, 23% had left employment by 2011.

Indigenous and non-Indigenous men have a similar pattern of changing occupational skill levels over a five-year period. The main difference is that Indigenous men who were employed in a skill level 1 job (highest skill level) in 2006 were 22 percentage points less likely than their non-Indigenous counterparts to remain in the skill level 1 job in 2011. The other differentials between the propensity to stay in a particular occupational group for Indigenous and non-Indigenous males were substantially less than the differential observed for the highest skill occupation. The

propensity for male Indigenous workers to stay in the same occupation was uniformly less than non-Indigenous workers in all occupational skill groups. The next biggest differential between Indigenous and non-Indigenous males was in the middle of the skill distribution (occupational skill level 3 for whom the differential is 10 percentage points). The main pattern in Table 3 is the relatively high rate at which Indigenous workers became non-employed. We will return to this point shortly.

Some differences are also evident between Indigenous and non-Indigenous women in changes in occupational skill level between 2006 and 2011, although the differentials are much smaller than that observed for highly skilled males. For the middle of the skill distribution, the differential between Indigenous and non-Indigenous female workers' propensity to stay in the same skill level was relatively small. The largest differentials between Indigenous and non-Indigenous females are for occupational skill-levels 1 and five (10/11 percentage points less likely to stay in the same occupational skill group).

This observed mobility pattern indicates that Indigenous males and females were less likely to remain in the same occupational groups between 2006 and 2011 than non-Indigenous male and females. However, the differential is least for Indigenous females than for non-Indigenous females. The relatively high level of Indigenous people not staying in skill level 5 jobs may be because only a small number of employed in the ACLD were actually working in the CDEP scheme in both 2006 and 2011. However, the large differential in mobility of Indigenous males out of high-skill jobs needs to be understood.

The data in Table 3 also shows the percentage of workers with various occupational skill level in 2006 who were not employed in 2011.[5] It could be that people lose their jobs or some family/individual circumstance led to the non-employment outcome. However, it will also reflect the low rates of job retention among the Indigenous population (Hunter and Gray 2016). The distinct occupational mobility pattern among high-skill Indigenous males is driven largely, but not wholely, by the relatively high probability that those Indigenous workers leave the workforce between censuses.

Among males employed in jobs with the highest occupation skill level (skill level 1), Indigenous males were 15 percentage points more likely to become non-employed. Hence, the high level of turnover commonly observed among Indigenous workers is even evident among highly skilled workers and jobs. Indigenous females employed at skill level 1 were 6 percentage points more likely than non-Indigenous females in similar jobs to leave employment between 2006 and 2011. Indigenous workers with mid-level skills were also more likely to become non-employed in this five-year period, because the probability of such a transition is less than the average Indigenous workers. However, for Indigenous workers employed at skill level 5, Indigenous males were 16 percentage points more likely than non-Indigenous males to become non-employed, while low skilled Indigenous females were 21 percentage points more likely to become not employed than their non-Indigenous counterparts. To the extent that wages are lower in such jobs, the opportunity cost of leaving employment would be lower.

Overall, this could be interpreted as reflecting that job retention is particularly low among low-skilled workers (i.e. low-skilled workers are more likely to leave the labour market than highly skilled workers). This observation is particularly pronounced for low-skilled female workers. However, the rates of leaving employment are much higher for Indigenous workers than non-Indigenous workers, irrespective of the initial level of skill. Given that CDEP participation was concentrated among males doing relatively low-skilled tasks in 2006, the substantial decline in the CDEP scheme in this period does not explain the differential extent to which Indigenous and non-Indigenous workers left the labour market between 2006 and 2011.

Table 4 presents estimates of occupational skill level in 2011 according to labour force status in 2006. The table provides information on the skill level of jobs for people moving into employment between 2006 and 2011, and how this compares with people who were employed in both 2006 and 2011. Hunter and Gray (2016) identified that Indigenous Australians in the younger age groups were less likely than non-Indigenous Australians of the same age to be employed at any given point in time, and were less likely to stay employed between the 2006 and 2011 censuses. We expect the occupational mobility for youth to be more affected by recent educational experience than the mobility for the mature age population, since most of the latter group have finished their post-secondary educational participation. Furthermore, recent education and training may focus on marketable skills, to the extent that educational choices respond to market incentives, and hence may be more relevant in a changing labour market. Given the relatively young age of the Indigenous population and the likely importance of the transition from education into the labour market, the estimates in Table 4 are presented separately for youth aged between 15 and 24 in 2006 and those aged 25 to 59 in 2006.

Table 4. Labour force status 2006 by occupational skill level 2011 (%)

Age	*Indigenous status 2006*	*Labour force status 2006*	*Occupational skill level 2011*					*Total*	*Unweighted counts*
			1	*2*	*3*	*4*	*5*		
15–24 years	Indigenous males	Employed	12	10	24	28	25	100	357
		Not employed	11	4	25	25	35	100	256
	Non-Indigenous males	Employed	23	10	30	22	15	100	26 880
		Not employed	19	8	25	24	24	100	12 402
	Indigenous females	Employed	17	12	7	42	22	100	279
		Not employed	14	9	8	42	27	100	241
	Non-Indigenous females	Employed	32	12	8	32	15	100	25 008
		Not employed	24	9	7	35	25	100	11 453
25–59 years	Indigenous males	Employed	20	12	17	31	21	100	1 177
		Not employed	18	11	10	29	32	100	224
	Non-Indigenous males	Employed	35	13	20	21	11	100	144 111
		Not employed	25	11	19	25	20	100	8 859
	Indigenous females	Employed	30	16	5	32	17	100	1 170
		Not employed	16	13	6	38	26	100	405
	Non-Indigenous females	Employed	36	13	7	30	14	100	119 143
		Not employed	23	10	7	35	25	100	20 013

Note: Linked longitudinal sample for people aged 15–59 years in 2006. Estimates based on data weighted to estimated residential populations.
Sources: ACLD 2006–11, Data Analyser

Indigenous people moving into employment are more likely to be employed at the low-skilled end of the labour market than non-Indigenous people. Young Indigenous men who move into employment are much more likely to employed in the lowest skill level jobs (skill level 5) (35% cf 24%) and less likely to be employed in the highest or second highest skill level jobs than their non-Indigenous counterparts. The differences in occupational skill level between young Indigenous women and young non-Indigenous women moving into employment were smaller than for men, with little difference in the proportion employed in the lowest skilled jobs, but Indigenous women were much less likely than non-Indigenous women to be employed in the highest skill level occupations (14% cf 24%).

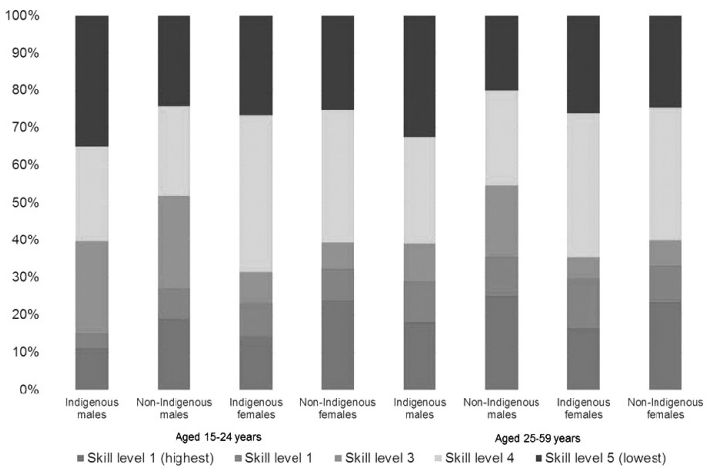
Young Indigenous women entering employment were more likely to be employed in higher-skilled jobs and less likely to be employed in lower-skilled jobs than were young Indigenous men.

Indigenous men and women aged 25–59 years in 2006 moving into employment wee less likely to be employed in the highest skilled jobs than their non-Indigenous counterparts. However, while Indigenous men were more likely to be employed in the lowest skilled jobs than were non-Indigenous men (32% cf 20%), this was not the case for Indigenous females for whom the differences was small (26% cf 25%).

Of course, these observations are just reporting labour force status at two points in time: at the time of the 2006 and 2011 censuses. The analysis in this paper provides some insight into how Indigenous people move into the labour market in the long term, even if there was some movement between labour force states in the short term.

Fig. 2 provides a graphic illustration that the major entry of Indigenous youth into the labour market was through low-skilled occupations. Older Indigenous males and females were more likely to secure a high-skilled job from non-employment than Indigenous youth. This is probably associated with the older profile of Indigenous students, many of whom start tertiary studies later in life (Gray et al. 2014).

Fig. 2. Occupational skill level in 2011 for those who were not employed in 2006, by age and Indigenous status



Note: See Table 4.
Sources: ACLD 2006–11, Data Analyser

4. Discussion

This paper presents the first longitudinal analysis of the occupational dynamics of the Indigenous population and compares this with occupational dynamics for non-Indigenous Australians. Most research on occupational mobility focuses on changes in occupation for those who are already employed. However, this paper takes a broader definition of occupational mobility that considers movement into and out of the workforce from various occupations.

Our analysis confirms previous research (Coelli and Borland 2016) by showing that, in general, workers in higher-skilled jobs were more likely to still be employed after five years than those in lower-skilled jobs. As Indigenous people were more likely to be employed in low-skilled jobs, this highlights their vulnerability to job losses occurring as a result of broader macrcoeconomic trends. In addition, the analysis shows that Indigenous workers at each skill level were more likely to move out of employment within five years than non-Indigenous workers. The international trend towards job polarisation means that Indigenous people are less concentrated in high-skilled occupations that have experienced relatively high growth rates. Unless Indigenous people can secure jobs in occupations that are less prone to routinisation, the ability to further increase Indigenous employment rates will be constrained. Further research into Indigenous occupational mobility is required.

Of particular note was the large degree of downward mobility among Indigenous men in the highest skilled occupations. They were far more likely to leave highest skill occupations for lower-skilled occupations, and were more likely to leave employment than were their non-Indigenous counterparts. Highly skilled Indigenous males were also more likely to leave employment than most other Indigenous workers, except those in the lowest skill occupations. This finding is a major contribution to the literature, but why was this the case?

Several possible explanations could explain this finding. First, highly skilled Indigenous males may not be well matched with the requirements of their existing employers. This mismatch may be manifest as a pronounced dissatisfaction among those workers who leave employment in relatively large numbers. If that were the case, creating Indigenous-friendly workplaces may partially be the answer (Hunter and Gray 2013b). Second, the complex social dynamics of Indigenous households may make it difficult to sustain productive work patterns expected by businesses paying substantial wages to highly skilled workers. The fact that the labour force exits of highly skilled Indigenous females are not as pronounced as those for highly skilled Indigenous males (vis-à-vis their non-Indigenous counterparts), mean that further research is need to identify the factors driving these observations.

Indigenous men and women entering employment are more likely to be in lower-skilled jobs than their non-Indigenous counterparts. Once employed in low-skilled jobs, Indigenous workers are also less likely to progress to higher-skilled jobs over time than their non-Indigenous counterparts.

These occupational dynamics are important contributors to the lower occupational status of the Indigenous population. They also highlight the challenges that the Indigenous population will face if the projected increases in the relative

demand for higher-skilled jobs increases (World Economic Forum 2016). Given that the ageing population is likely to increase the demand for workers in health care and personal service sectors, where occupations are historically female dominated, policy to enhance labour market engagement of low-skilled Indigenous males is likely to be particularly challenging.

Although the analysis that is possible using the ACLD is limited because data are available only for two points in time, the longitudinal analysis presented in this paper is an advance on the existing research, which has been restricted to a cross-sectional analysis. Having data for only two points in time, five years apart, means that we cannot say what happened between the census dates. The analysis of occupational dynamics presented in this paper could be extended in several ways. First, the Household, Income and Labour Dynamics in Australia (HILDA) survey, which provides a detailed employment calendar and information on occupation at the time of the annual interview, could be used. Although HILDA contains very detailed data on employment dynamics, analysis is limited by the relatively small Indigenous sample. In our judgment the more fruitful approach will be to use the ACLD to gain further insights into the characteristics of people who changed occupation or moved into and out of the workforce from particular occupations. Multivariate analysis of changes in occupational skill level is likely to provide some relevant insights.

Linking the 2016 Census to the 2006 and 2001 censuses will allow the longer-term dynamics of occupation to be analysed. While there is a need for more detailed longitudinal analysis – for example, using job calendars such as provided in HILDA – it should be possible to exploit ACLD data on Indigenous Australians to provide a gain further insights into Indigenous occupational mobility and how it compares to that of the non-Indigenous population.

This paper has provided some stylised facts, which can be further understood through careful analysis of such data and techniques. Identifying the characteristics of people associated with movements in mobility will help policy makers target their policies appropriately.

Appendix A Occupational mobility between censuses

Table A1. Occupational skill level in 2006, by gender, Indigenous status and skill level in 2011

Indigenous status 2006	*Occupation skill level 2006*	*Occupational skill level 2011 (%)*					*Total (%)*
		1	*2*	*3*	*4*	*5*	
Indigenous males	1	63	17	4	11	5	100
	2	25	52	4	15	4	100
	3	12	7	61	12	9	100
	4	9	7	7	65	12	100
	5	12	3	9	23	53	100
	Total	20	12	17	30	21	100
Non-Indigenous males	1	76	9	5	7	3	100
	2	25	46	9	12	7	100
	3	10	7	67	9	6	100
	4	14	8	8	61	10	100
	5	11	8	11	22	48	100
	Total	35	13	20	21	11	100
Indigenous females	1	72	11	1	11	4	100
	2	24	43	3	22	8	100
	3	9	17	38	24	11	100
	4	19	13	2	58	9	100
	5	8	5	3	23	60	100
	Total	30	16	5	32	17	100
Non-Indigenous females	1	79	7	2	10	2	100
	2	21	44	5	22	8	100
	3	11	12	46	22	8	100
	4	13	11	5	63	8	100
	5	7	8	4	22	59	100
	Total	36	13	7	30	14	100

Note: Linked longitudinal sample for people aged 20–59 years in 2006 who were employed in 2006 and 2011. Estimates based on data weighted to estimated residential populations.
Sources: ACLD 2006–11, Data Analyser

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Notes

1 The polarisation of jobs has also been found in many countries in the Organisation for Economic Co-operation and Development (e.g. Goos et al. 2014).

2 People in the ACLD who identified as Indigenous in 2006 but as non-Indigenous in 2011 were more likely to live in urban areas, while those who changed identification from non-Indigenous to Indigenous were more likely to have relatively poor socioeconomic outcomes (Biddle and Crawford 2015). Although further ACLD analysis of occupational mobility can control for those changing Indigenous status between censuses (e.g. in a multivariate context), the number people changing status was relatively small, and we focus on the occupational mobility to identify the main patterns in the data.

3 This restriction was relaxed for Table 2, which includes all people aged 15–59 in 2011, because it is simply attempting to describe the concordances between skill levels and broad definitions of occupations.

4 In developing the skill specialisation criteria for ANZSCO, employability skills were cznsidered as a possible additional dimension of skill specialisation (ABS 2006). There are two facets to employability skills – personal attributes such as loyalty, comsmitment and motivation; and generic skills, including communication, team work and problem-solving. Employers are increasingly using employability skills in conjunction with technical or job-specific skills when assessing the suitability of an individual for a particular occupation. Since these employability skills are applicable to most occupations, it was decided not to include them as classification criteria for ANZSCO.

5 The relatively small Indigenous sample size means that it was not possible to distinguish between the different categories of non-employment (unemployment or not in the labour market) for certain skill categories.

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the **CENTRE** *for*
LABOUR MARKET RESEARCH

The Centre is a consortium of Curtin University, Murdoch University, the University of Canberra and the University of Western Australia.

The objectives of the Centre are to further the understanding of labour market and related issues through research, with special reference to Australian labour markets. The Centre promotes the exchange of knowledge and expertise on labour economics and labour relations between the academic community, governments, business and trade unions.